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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: M.R. Jackson et al.

Application No. 09/682,899

: Examiner: J.M. McAleenan

Filed: October 31, 2001

: Response to Paper No. 7

For: REPAIR OF ADVANCED GAS TURBINE BLADES

RESPONSE TO OFFICE ACTION

Assistant Director of Patents and Trademarks
United States Patent and Trademark Office
Washington, DC 20231

Sir:

Applicants appreciate the consideration shown by the Office as evidenced by the Office Action mailed on May 20, 2003. In that Office Action, the Examiner rejected claims 1-12, 28, 34-48, 64-78, 102-117, and 133-140, and objected to claims 13-27, 29, 49-63, 79-101, and 118-132. Applicants respectfully request reconsideration of the application by the Examiner in light of the following remarks offered in response to the Office Action.

1. Claim Objections

The Examiner objected to claims 73 and 104 on the grounds that they do not differ substantially from one another and therefore unduly multiply the same invention.

Applicants respectfully disagree with this assertion. Claim 73 is directed to a freestanding tip

insert for the manufacture and repair of a turbine blade tip. On the other hand, Claim 104 is directed to a turbine blade that comprises at least one insert joined to the body of the blade. Clearly, claim 104 differs substantially from claim 73 in that the embodiment recited in claim 104 is a component suitable for use in a turbine engine, for example, while the embodiment recited in claim 73 is only potentially a portion of such a component. Applicants respectfully submit that the scope of the desired coverage is clear and that the claims are not presented in a manner that would be confusing to the Examiner or to the public. Applicants note that in this case "the claims were clear enough for the Examiner to apply references against all of them in his first office action." See *In re Wakefield*, 422 F.2d 897,902, 164 USPQ 636, 639 (CCPA 1970). Applicants therefore respectfully request reconsideration of the objection.

The Examiner further objected to claim 34, stating that this claim merely repeats the limitations of claim 1. However, Applicants respectfully point out that while claim 1 recites a method for repairing a turbine blade, claim 34 recites a turbine blade repaired by the claim 1 method – it is a product by process claim – and as such it recites a different embodiment than claim 1. See MPEP 2173.05(p) I. ("A product-by-process claim, which is a product claim that defines the claimed product in terms of the process by which it is made, is proper") and MPEP 2173.05(f) ("[C]laims which read, 'The product produced by the method of claim 1.'...[is] not indefinite under USC 112, second paragraph, merely because of the reference to another claim."). Applicants therefore respectfully submit that claim 34 is a proper claim.

2. Claim Rejections – 35 USC § 102

A. Arnold, Ferrigno et al., or James et al.

Claims 1-12, 28, 34-48, 64-78, 102-117, and 133-140 were rejected under 35 U.S.C. 102(b) as being anticipated by either Arnold (U.S. Patent Number 6,049,978), or Ferrigno et al. (U.S. Patent Number 5,846,057), or James et al. (U.S. Patent Number 6,491,208).

Applicants respectfully traverse this rejection and request reconsideration.

Applicants respectfully submit that the rejected claims are patentably distinct from each of the three applied references because none of these references teaches, suggests, or discloses a "freestanding tip insert" as recited in independent claims 1, 35, 36, 37, 71, 72, 73, 102, and 103 of the present application. Each of the three references sets forth a process whereby repair material is directly deposited onto a defective region of an article using a build-up (layer-by-layer) method, in stark contrast to the use of freestanding inserts as recited

in the aforementioned present claims. Arnold employs "a build-up thickness of coating material" deposited directly on the part using "a high-density coating process." Arnold, Abstract. Ferrigno et al. describes the use of a typical weld repair or braze repair process, in which weld filler or braze filler material is deposited directly in a defective area of a component to build-up to the desired dimension, and combines this process with laser shock peening to improve the fatigue life of the repaired area. Ferrigno, col. 2, lines 59-62; col. 3, line 59-col. 4, line 31; col. 7, lines 2-13. In particular, the embodiment in Ferrigno directed toward blade tip repair uses a weld process to build-up the tip to its original dimensions, where weld filler material is deposited directly on the damaged blade. Ferrigno, col. 8, lines 4-13. James et al. also describes the repair of damaged turbine components via build-up methods, either by "filling the crack repair volume with weld metal" (col. 2-lines 17-20) or by spraying particles onto a repair area to build-up the component to desired dimensions. Col. 2, line 48- col. 3, line 50. None of the applied references describes or remotely suggests a process using freestanding inserts to repair blade tips, and thus independent claims 1, 35, 36, 37, 71, 72, 73, 102, and 103, which recite "freestanding insert," are patentably distinct from these references.

Independent claims 104, 139, and 140 do not recite the word "freestanding," but do recite the term "tip insert." "When the specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art." MPEP 2173.05(a), *citing In re Zletz*, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989). In the present specification, paragraph 24, the term "tip insert" is clearly set forth to mean "a freestanding article suitable...to be used as a blade tip or portion of a blade tip upon being disposed onto a blade body." Thus Applicants have clearly distinguished a blade having an insert joined to a blade body from a blade having cracks filled using a weld, braze, or thermally sprayed built-up tip, in that the former comprises the use of a freestanding insert while the latter employs directly deposited layers of material. Applicants thus respectfully submit that independent claims 104, 139, and 140 are also patentably distinct from the applied references.

In light of the above discussion, Applicants respectfully submit that independent claims 1, 35, 36, 37, 71, 72, 73, 102, 103, 104, 139, and 140 are allowable over the applied references. Moreover, their respective dependent claims included in this rejection are also

allowable because each depends from an allowable independent claim. Therefore, Applicants respectfully submit that claims 1-12, 28, 34-48, 64-78, 102-117, and 133-140 are patentably distinct over the three applied references, and respectfully request favorable reconsideration.

B. Lee et al. or Rigney et al.

Claims 1, 36, 72, 103 and 140 were rejected under 35 U.S.C. 102(b) as being anticipated by either Lee et al. (U.S. Patent number 6,461,108) or Rigney et al. (U.S. Patent Number 6,042,880).

Applicants respectfully submit that the rejected claims are allowable over the applied references using a similar argument to that used above: neither of the references teaches, suggests, or discloses the use of a freestanding insert as recited in claims 1, 36, 72, 103, and 140. Lee et al. describes the application of a metallic bond coat directly on the component, thereby partially filling apertures previously machined into the component. Lee et al., col. 4, lines 38-51. The bond coat is not a freestanding insert as recited in the above claims and defined in the specification, but instead is a coating layer applied to the component. Similarly, Rigney et al. describe a method of repairing a thermal barrier coating system that involves removing the top ceramic layer and at least a portion of the bond coat, then applying metallic coating on top of the exposed bond coat. Again, the description is of the direct deposition of a coating layer, not the use of a freestanding insert. Applicants therefore submit that claims 1, 36, 72, 103, and 140 are not anticipated by either of the applied references.

3. Allowable Subject Matter

Applicants note with appreciation the Examiner's remarks that claims 13-27, 29, 49-63, 79-101, and 118-132 recite allowable subject matter. Applicants believe that all independent claims are in condition for allowance, and therefore respectfully submit that each of claims 13-27, 29, 49-63, 79-101, and 118-132 is allowable because each depends from an allowable independent claim.

4. Conclusion

In light of the remarks presented herein, Applicants submit that the case is in condition for immediate allowance and respectfully request such action. If, however, any issues remain unresolved, the Examiner is invited to telephone the undersigned at the number provided below.

Respectfully submitted,

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